REMARKS/ARGUMENTS

All claims have been rejected under 35 U.S.C. over Topham in view of Frakas. This rejection is respectfully traversed.

The claims under consideration in this application relate to a polymeric colored dispersant and dispersion in which the dispersant comprises the structure A-(B-X)$_n$ in which A is an organic chromophore, B is a covalent bonded linking moiety containing nitrogen and at least one sulfur or oxygen and X is a 50 to 200 carbon atom polymeric linked hydrocarbon with n being an integer from 1 to 4. Colored polymer materials based on a polyoxyalkylene polymers are known but these are not suitable for use as pigment dispersant in non-polar systems and do not decrease the viscosity of pigment dispersion when employed in a relatively small amount such as up to 15% w/w pigment. The present dispersants are suitable for use in non-polar systems and can be used in such relatively small amounts. Accordingly, one feature of the invention is that the dispersant significantly decreases the viscosity of a dispersion containing relatively small amounts of the dispersant which permits inclusion of more colorant and results in highly colored concentrations that can be satisfactorily handled and dispersed in lithographic printing inks, for example.

Another important characteristic in lithographic inks, that is in addition to viscosity, is the interfacial tension. For best results, the dispersion should have a low relative interfacial tension drop (RIFTD). As shown in Table 1 in the application, use of prior art dispersants have significantly increased the RIFTD despite the fact that they may lower viscosity whereas the dispersants of the present invention provide a significantly lower RIFTD, which can be the same as where no dispersant is used or even lower while at

the same time reducing viscosity. The RIFTD characteristic of the dispersants of the present invention are surprising and unexpected and is not predictable from the prior art.

Topham relates to dispersions of organic pigments using a dispersing agent of the formula D-(Z-R)$_a$. The reference states that the nature of the bivalent bridging group Z is "not critical" (page 1, lines 32-33) and the nature of the residue R is also not critical since it can be derived from "any" addition polymer or copolymer and it need not even be attached directly to the linking group but can also be attached to through a substituent (page 1, lines 44-49). It is preferably that R is "solvatable" and Topham refers to the Frakas reference for the definition of this terminology. As to suitable polymers, Topham itself references polyalkylene oxides such as those listed in Frakas (page 1, lines 68-71) which, by virtue of the presence of the oxygen, is not a hydrocarbon residue. None of the dispersing agents set forth as examples staring at page 2, line 103 of Topham, contain a hydrocarbon residue as R. While Topham further indicates that the amount of dispersing agent present can correspond to between 5 and 100% by weight based on the weight of the pigment, all of the examples in this reference contain about 50% or more of the dispersing agent based on the weight of the pigment.

Applicants previously pointed out that Topham represented a shotgun disclosure vis-à-vis the present claims. The Examiner has stated her disagreement. Reconsideration of this disagreement is respectfully requested in light of the following comments.

The Examiner has observed that there appears to be a 60% chance the skilled person would select a bridging group Z which reads on the instant claims and then combine it with preferable polymer chain from the Frakas reference. However, if one is

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going to rely on any statement of preference in Topham or another reference, then it must be noted that Topham explicitly states that not only should the linking group Z be a hydrocarbon but it should explicitly be a methylene group. Neither the methylene group nor the hydrocarbon linking moiety is within the scope of the present claims. This means that the reference leads the skilled person away from make selections leading to the instant compounds. Further, the reference to "60%" in the Office Action applies only to some of the claims in the application and ignores the limitations of others. Thus, different considerations apply to those claims in which the linking group contains nitrogen and sulfur. Each pending claim needs to be evaluated separately. [The same consideration applies to the claims which indicate n is 1 or 2.]

Putting aside the statement of preferences, it will be appreciated that since Topham indicates that there is no limitation of possible linking groups, the number of possibilities falling within the scope of Topham's formula is huge. Similarly, Topham indicates that the residue R may be derived from "any" addition polymer or copolymer. That means that the number of possible R materials is also huge and it necessarily follows that from the fact that the number of possibilities for each of Z and R are so great, the number of combinations and permutations of (Z-R) is immense. The only limitation on R in Topham is that it should be "solvatable" which is stated to mean that the R group can exist in an extended molecular state in the solvent being employed. Beyond the foregoing, Topham indicates that the number of (Z-R)s group can be from 1 to 8. That means the number of combinations and permutations of (Z-R), which is already immense, must then be multiplied by 8. It is clear that the number of possibilities runs into the multimillions, if not billions.

The guidance provided from the reference should, of course, be considered. In this respect, Topham tells the art to select methylene as the linking group and polyoxyalkylene chains as the solvatable chains R. Following either of these preferences takes the skilled person away from the instant invention. Following both, increases the distance .

It is respectfully submitted that the reliance on the Frakas patent in the Office Action for modifying Topham and limiting the number of possibilities is not valid. First, Topham explicitly relies on Frakas only for the definition of the term "solvatable" and in that context, for R groups derived from polyalkylene oxides. Second, the Frakas reference itself relates to a very different type of dispersant. The moiety linked to the aromatic group is C(O)O- or (CH=CH)C(O)O-, both of which linking groups are devoid of nitrogen (and sulfur). Third, the term "solvatable" relates to a characteristic of one or possibly two R moieties in the generic formula of page 1 of Frakas, and the entire entity attached to the "linking" group in Frakas contains oxygen, i.e., it is not a hydrocarbon entity. Fourth, as to possible "solvatable" groups, Frakas discloses a huge number of possibilities, including polyester chains, the polyalkylene oxides specifically mentioned by Topham, high molecular weight epoxy resins, polyamide resins, polymerized drying oils, phenol-formaldehyde resins, urea formaldehyde resins, melamine formaldehyde resins, polyurethanes, esters of acrylic, methacrylic and ethacrylic acids, vinyl esters, polymers of saturated hydrocarbons, styrene polymers, polymers of vinyl halides and vinyl esters, (meth)acrylic polymers and amides thereof, polyethylene and polypropylene glycol polymers, hydroxylated polymers and polymers of glycol (meth)acrylates. It is respectfully submitted that looking only at the groups found only on page 2, lines 56-58 of Frakas, as is done in the Office Action, is not proper because it constitutes, at a minimum, a

selection from all of the dispersing chains set forth at lines 45-58 without any basis for that selection or suggestion in the reference and also because Topham directs attention only to the polymers of alkylene oxides at lines 26-28 (page 1, lines 70-71). It is a hindsight selection and contrary to the teachings of the reference.

Applicants do not dispute that it is theoretically possible to make appropriate selections from these two references and thereby reconstruct something falling within the scope of claims under consideration. However, one skilled in the art would not do so unless the instant claims were used a template. That reconstruction requires the skilled person to first ignore Topham's explicit preference for a methylene linking group and select a linking group which contains nitrogen and either sulfur or oxygen. Then the skilled person must ignore Topham's preference for a residue derived from a polyalkylene oxide and choose a residue from a hydrocarbon. Then, the person must select a hydrocarbon residue containing 50 to 200 carbon atoms or 50 to 150 carbon atoms (as opposed to 1-49 carbon atoms or more than 200 carbon atoms). Thereafter, the skilled person must also select having 1 to 4 residues (or 1 to 2 residues) as opposed to 5 through 8 residues (or 4 to 8 residues) which is in the scope of the Topham reference. While it may be theoretically possible to make all of these choices simultaneously, to do so would be serendipitous because the number of possibilities for each of these choices, considered alone, is virtually unlimited so that the number of combinations and permutations runs into the multimillions if not billions. There is nothing in either of these references which points one skilled at the art in making the correct selections and quite to the contrary, there are explicit directions in the references to make selections which fall outside the scope of the instant claims. It is respectfully submitted that the selections hypothesized in the Office Action were made using hindsight, which is not proper. Without using hindsight,

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the "likelihood of producing a composition such as here claimed...would be about the same as the likelihood of discovering the combination of a safe from the mere inspection of the dials thereof." *In re Luvisi*, 144 USPQ 646 (CCPA 1965) and quoting from *Ex parte Garvey* (41 USPQ 583, 584)(Bd. App.) with emphasis by the Board).

The recent KSR Guidelines issued by the Office point out that obviousness can be based on a selection from a finite number of possibilities. As discussed above, the number of possibilities here is not finite but rather it is essentially infinite and requires ignoring explicit suggestions to avoid making incorrect reconstruction choices.

Beyond all of the foregoing, there is nothing in the references which teach the surprising, unexpected and unpredictable result achieved with the dispersants of the present invention. The application on pages 10-13 demonstrates that the use of a dispersant for different pigments not only provided a lower viscosity but also provided a relative interfacial tension drop which was very much lower than the RIFTD achieved using other dispersants.

In light of all of the foregoing considerations, it is respectfully submitted that the prior art rejection should be withdrawn and the application allowed.

Dated: March 3, 2008   Respectfully submitted,

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